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ABSTRACT

This study followed 513 graduates of regular, gifted, and private school programs in Ontario over 4 years as students at York University (Toronto). Overall, the study found that having participated in a gifted program in high school did not result in increased levels of achievement in university. However, it did find that graduates of gifted high school programs had slightly more positive self-concepts than other students in some areas. Tables summarize data on high school program by family income, grade point average, and by high school program and the following self-assessed skills: thinking and reasoning skills, problem solving skills, planning and organizing skills, communication skills, interpersonal skills, and quantitative skills. (Contains 25 references.) (DB)

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THE PERFORMANCE OF 'GIFTED' HIGH SCHOOL STUDENTS IN UNIVERSITY

J. PAUL GRAYSON

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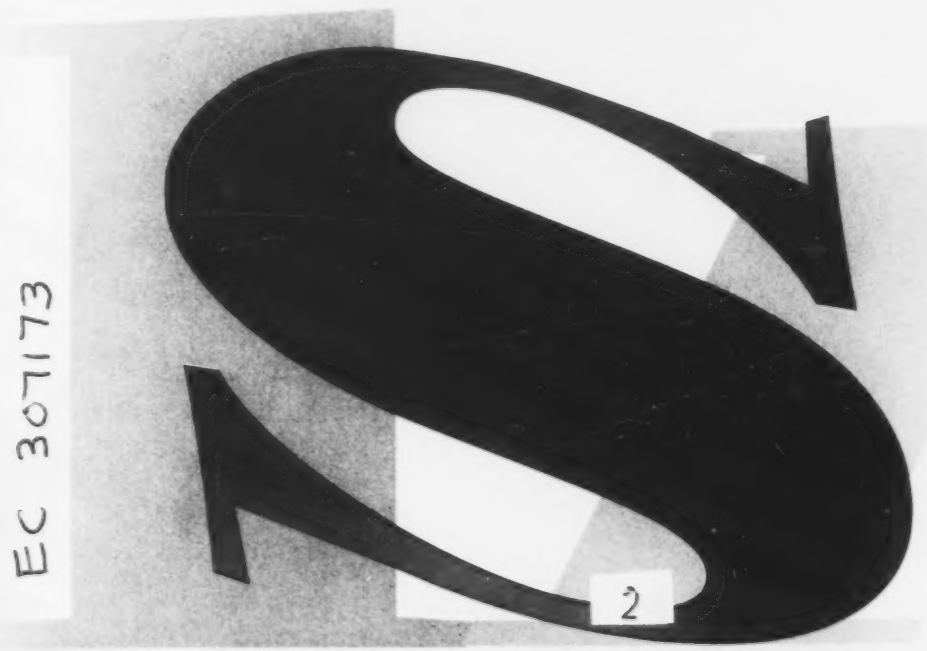

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Other Publications on York Students

The Student Experience at York University: The Effects of Income, Race, and Gender Over Four Years
J. Paul Grayson (1999)

The Performance of 'Gifted' High School Students in University
J. Paul Grayson (1999)

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Response Effects: Variations in University Students' Satisfaction by Method of Data Collection
David A. Northrup and Michael Ornstein (1993)

Student Withdrawals at York University: First and Second Year Students, 1984-85
Gordon Darroch, David A. Northrup and Mirka Ondrack (1989)

Summary

In Ontario, school boards are required to provide opportunities so that 'gifted' students (i.e. those with exceptional abilities) can obtain learning experiences that are beyond those offered in regular classes. This study follows graduates of regular and gifted programs, and a small sample of private school graduates, over four years of studies at York University in Toronto. Overall, it is found that having participated in a gifted program in high school does not result in increased levels of achievement in university; however, graduates of gifted high school programs have slightly more positive self-concepts than other students in some skills. This finding aside, it is difficult to argue that participation in a high school gifted program confers an advantage on students once they get to university.

Introduction

In their introduction to a series of articles on 'giftedness', psychologists Sternberg and Davidson (1986:3) argue that, "giftedness is something we invent, it is not something we discover." More concretely, what passes as giftedness in one society may not necessarily qualify in another (being a skilled plains hunter will not further a career in the metropolis). From a sociological perspective it can be added that what is accepted as giftedness in one class or group in society may not be shared by all. This line of thinking is consistent with analyses of multiple intelligences and the ways in which particular societies foster their development (Gardner, 1984, 1985; Sternberg, 1990).

Usually, the dominant view of giftedness is one that is articulated and propagated by those who enjoy a differential amount of power in certain institutions. In contemporary Western societies institutions that contribute to both dominant definitions of giftedness and, in some instances, offer alternative conceptualizations include churches, political parties, schools, colleges, universities, government ministries, and special interest groups such as the Association for Bright Children in Ontario.

While giftedness is socially constructed, the process of construction is not always clear. (For an examination of the process in a number of societies see Heller and Feldhusen, 1986). For some the social construction process is based on the belief that giftedness is an individual property. As a result, it is necessary to identify those with such properties so that they can be placed in the appropriate programs. For others environmental circumstances lead to behaviours that may be defined as gifted. For these individuals, it is necessary to provide environments suitable to the emergence of giftedness. In contrast to each of these positions other researchers prefer one that considers the interactive effect of both personal and environmental factors.

In Ontario Bill 82, an amendment to the Education Act of 1974 (Smyth, 1984:145), defined the gifted as students who display:

> an unusually advanced degree of general intellectual ability that requires differentiated learning experiences of a depth and breadth beyond those normally provided in the regular program to satisfy the level of potential indicated.

In specifying this definition the Bill sidesteps the etiological issue noted above. Instead, it takes an observed "advanced degree of general intellectual ability" as a starting point. Whether the observed intellectual ability is an individual property that would have developed even under adverse conditions, or whether the ability is a result of favourable environmental contexts, is not addressed (nor

could it be). Had the issue been addressed, and had it been recognized that individual properties go only so far in explaining an "advanced degree of general intellectual ability," the implications of the recognition would have gone well beyond the Education Act.

Consistent with the underlying conception of giftedness, within the broad legislative framework established by Bill 82, individual school boards are given the freedom to establish processes that will have the net effect of yielding individuals deemed as gifted. In accordance with the regulations accompanying Bill 82, the first step in constructing giftedness, nomination, can be taken by teachers, parents, individuals in the community, or the student him/herself: each can make a claim for the giftedness of the student under consideration. The rationale for such assertions can vary from a high I.Q. score to the belief on the part of a student's parents that their child is not realizing his/her full potential in traditional learning situations.

The second step in the construction of giftedness involves a Special Education Identification Placement and Review Committee (IPRC) that may include a Principal, Supervisory Officer, and Medical Practitioner. On the basis of what the school board in question deems relevant evidence the Committee may or may not designate the nominated student as gifted. In the event that a student is defined as gifted, he or she has the option of participating in various special 'enriched' programs. Should there be dissatisfaction with the decision of the IPRC, the Bill provides for an appeal process. It might be noted that a student who emerges as gifted through the process in one school board may not so emerge in another board. (For a general discussion of the process in Ontario see: Government of Ontario, 1990; Hodder, 1984; Keeton, 1983; Ontario Education, 1981; Smyth, 1984).

As noted by Hodder (1984:49), the Ministry of Education initially made some funds available to school boards to help cover costs associated with providing special programs for the gifted; however, given the ways in which school boards organize their budgets, it is not possible to gain a true picture of all costs associated with the provision of such programs. Any complete assessment of overall costs, among other measures, would have to include costs of special teacher training and hiring, the costs associated with determining giftedness, the provision of in many instances additional classroom space, the provision of additional books and supplies for the gifted, the costs of additional field trips taken by the gifted, and so on.

Opposition to programs for the gifted comes from at least two sources. First, many who oppose special programs for the gifted point to what they regard as a selection process that is biassed in favour of children from high socio-economic families. Second, some critics feel that the resources required to sustain

programs for the gifted could be put to better use in meeting the common needs of all students.

While there is no hard evidence with regard to the first of these concerns as they relate to education for the gifted in Ontario, it has long been known that, for example, scores on I.Q. tests are as much a measure of family income as anything else (Sternberg, 1985; Sternberg and Wagner, 1986). Moreover, it is obvious in many school boards that schools located in affluent areas yield more gifted students than schools in relatively poor areas. With respect to the second concern, there is hard evidence to show that some school boards have increasing difficulty in meeting needs shared by all students.

Whatever the case regarding the appropriateness of programs for the gifted, in Canada, no studies have focussed on their short- and medium-term *outcomes*. As a result, we do not know if participating in a gifted high school program gives graduates an advantage in future activities, such as university studies. It is reasonable to assume that if gifted programs enrol students with an 'advanced degree of intellectual ability', graduates would do better in university than students coming out of regular programs with the same Ontario Academic Credit (OAC) marks. Were this not to be found, it could be argued that either gifted programs are not recruiting students with advanced intellectual ability or that independent of intellectual ability gifted programs add no more value than regular programs.

Based on a four year longitudinal study this article will focus on the university achievement levels and skill assessments of graduates of regular and gifted programs, and graduates of private high schools attending York University in Toronto between 1994 and 1998. The data analysis will show that while graduates of gifted programs complete slightly more credits than other students, there are no differences in the academic achievement levels of gifted compared to other high school graduates with similar OAC marks. Graduates of gifted programs, however, have slightly more positive self-concepts than other students.

One possible interpretation for these findings is that either schools recruit students with positive self-concepts into gifted programs or that participating in a gifted program enhances an individual's self-concept. In either case, the positive self-concept may carry over to the university context. Whatever the case, it cannot be concluded that participation in a gifted program in high school will contribute to university success.

The Sample

Located on the northern fringe of Metropolitan Toronto, York University has approximately 40,000 full- and part-time students. Of students in first year, only 10% live in residence on campus and 70% live with their parents. Approximately half of first year students come from families in which the average family income is below the provincial average and 72% are of European descent.

At the end of their first year, in February and March of 1995, surveys were sent to all first year students who in 1994 entered the Schulich School of Business (SSB), Environmental Studies, Fine Arts, and Glendon College. Because of its large size, only a sample of students was selected from the Faculty of Arts. This procedure resulted in a sample size of 1,865 and an overall response rate of 64%. At the end of second year, in 1996, the questionnaire used in the 1995 study was again mailed to all students who entered in 1994 and who remained in SSB, Environmental Studies, Fine Arts, Glendon College, and Pure and Applied Science. In Arts, the original sample of respondents selected in 1995 was re-surveyed. The total number of respondents to the survey was 1,546 for a completion rate of 59%. The 1997 sampling procedure was the same as in 1996. A total of 1,217 students participated in the survey for a response rate of 52%.

By the end of 1997, 761 students had replied to all three end-of-year surveys carried out in 1995, 1996, and 1997. At the conclusion of the fourth year of study in 1998, 98 of the 761 students who had responded to the three end-of-year surveys had graduated or left the university. Completed questionnaires were obtained from 513 of the students who had responded to the previous three surveys who had not yet graduated or left the university. This number represents a response rate of 77%. Once adjustments are made for the number of students who left the university over the study period and, as a consequence, would not qualify for inclusion in the surveys, the survey retention rate between first and fourth years was 55%. (For more details on this calculation see Grayson, 1999.)

While there are no Canadian data with which to make comparisons, research conducted in the United States suggests that survey retention rates such as the foregoing are good. For example, Dey (1997:216) shows that in 1987 it was possible to retain only 26% of the participants in a large U.S. panel study of university students started in 1983. In 1989 only 23% of students who became involved in a similar panel study started in 1985 remained. Finally, in 1991, only 21% of students in a panel study started in 1987 stayed with the project. These and other data presented by Dey show that panel attrition in studies of students is high and that it is increasing with time.

Who Are the Gifted?

Of the students who responded to all four surveys, 85% graduated from regular high school programs, 11% were graduates of gifted programs, and 4% came from private schools. It is important to recognize that in all three categories students came from a wide range of schools. As a result, we can safely assume that any observed overall effects of type of program on achievement and other measures are not the effects of programs in particular schools. We cannot assume, however, that gifted high school students attending York are a representative sample of gifted students in the province.

In the introduction, it was noted that some critics believe that placement in a gifted program has as much to do with family income as with anything else; however, the figures in Table 1 show that while only 5% of students from the lowest income category (less than or equal to $25,999) come from gifted programs, with the exception of students with family incomes from $75,000 to $99,999 (22% of whom graduated from gifted programs) the numbers for the other three income categories who participated in gifted programs are more or less the same (around 11%). In short, while low income students are under-represented among the gifted, there is no consistent relationship between income and having participated in a gifted program. In addition, chi-square for the table is not statistically significant (.147).

Other analyses, not shown in table form, indicate that 10% of females and 14% of males had been defined as gifted. Although differences are small, chi-square for these differences is statistically significant. In addition, 0% of Black students came from gifted programs while the highest number of the gifted are found among those described as 'other non-European' (i.e., not Black, not South Asian, not Chinese, and not European). The figures for gifted students of South Asian, Chinese, and European origins are 7%, 4%, and 13% respectively. Because of the small numbers in some groups, and the fact that chi-square is not statistically significant, these findings should be treated cautiously.

Taken collectively, the information presented in this section suggests that being defined as gifted may be related somewhat to family income, gender, and ethno-racial origin. However, before definitive statements can be made, it would be necessary to conduct studies based on larger numbers, and a wider selection, of students from gifted programs.

Objective Measures of Achievement

The Ontario Academic Credit (OAC) marks of gifted and regular program students, and those from private schools are 83.9%, 79.5%, and 80.0% respectively. These differences are statistically significant at the .000 level.

Table 1: High School Program by Family Income

	LE $25,999	$26,000 to $49,999	$50,000 to $74,999	$75,000 to $99,999	GE $100,000
Regular	92%	86%	88%	73%	81%
Gifted	5%	11%	10%	22%	13%
Private	3%	3%	2%	5%	6%
Total	100% (62)	100% (117)	100% (98)	100% (41)	100% (173)

Chi square sig. = .147

Independent of these differences in grades, given the fact that gifted programs are intended to recruit, and deal with the needs of, students with an 'advanced degree of intellectual ability', it can be expected that graduates of gifted programs would have higher levels of academic achievement in university than other students with similar OAC marks. In essence, the benefits of a gifted education would add value over and above what is reflected in OAC marks. In order to see if this were true, a repeated measures analysis of variance was carried out in which sessional grade point average (GPA), as taken from administrative records, was the dependent variable. The independent variables were OAC marks, also taken from administrative records, and the high school program from which students graduated (regular, gifted, and private school) as determined through survey responses. The results of this analysis are found in Table 2.

The first column of the table provides information on the sessional GPA of *all* students for each year of study. It can be seen that the average GPA in the first year of study is 5.78. Thereafter, it increases progressively to a high of 6.20 in the fourth year of study. The 'Overall' GPA (6.00) is an average of scores over the four years. The significance level for F (.000) indicates that these differences are unlikely to have occurred by chance. In essence, the GPAs increase with level of study.

Columns three, four, and five provide information on the scores of graduates of regular, gifted, and private (school) programs averaged over the four years of study. The GPAs of students from regular and gifted programs are both 6.13 while those of private school graduates are a lower 5.74. The .291 significance level of F, as shown in column three, indicates that these small differences in scores could have occurred by chance. In essence, there are no overall differences in academic achievement that can be related to high school programs.

A more precise estimation of the relationship between program and GPA is provided by eta squared as found in column six, 'eta^2'. The .01 value for eta squared indicates that there is a very small relationship between program and GPA. Moreover, as seen from the significance level of F (.291) this level of association is not significant.

By comparison, the value of eta squared for OAC marks is greater than for program (.28) and is statistically significant at the .000 level. In essence, while program has no effect on GPA, OAC marks have a moderate effect on the sessional GPA. Overall, these findings show that graduates of high school gifted programs achieve grades similar to those of other students: their participation in a gifted program did not give them an advantage in university.

Table 2: Sessional GPA by Year and High School Program

Sessional GPA by Year		Sessional GPA by High School Program				
Year	GPA	Regular	Gifted	Private	Eta² Program	Eta² OAC
Year 1	5.78					
Year 2	6.00					
Year 3	6.12					
Year 4	6.20					
Overall	6.00	6.13	6.13	5.74	.01	.28
Sig. F	.000	.291				.000
N	473	400	55	18		

Table 3: Sessional Credits by Year and High School Program

Sessional GPA by Year		Sessional GPA by High School Program				
Year	Credits	Regular	Gifted	Private	Eta² Program	Eta² OAC
Year 1	27.2					
Year 2	25.6					
Year 3	24.5					
Year 4	22.4					
Overall	24.9	24.8	26.1	23.8	.02	.11
Sig. F	.099	.013				.000
N	473	400	55	18		

Table 4: Thinking and Reasoning Skills by Year and High School Program

Sessional GPA by Year		Sessional GPA by High School Program				
Year	Skills	Regular	Gifted	Private	Eta² Program	Eta² OAC
Year 1	3.94					
Year 2	3.94					
Year 3	3.98					
Year 4	3.95					
Overall	3.95	3.83	4.19	3.84	.04	.01
Sig. F	.697	.042				.079
N	465	394	53	18		

Table 5: Problem Solving Skills by Year and High School Program

Sessional GPA by Year		Sessional GPA by High School Program				
Year	Skills	Regular	Gifted	Private	Eta² Program	Eta² OAC
Year 1	3.79					
Year 2	3.80					
Year 3	3.86					
Year 4	3.84					
Overall	3.82	3.68	4.09	3.69	.05	.01
Sig. F	.516	.000				.019
N	462	391	53	18		

Table 6: Planning and Organizing Skills by Year and High School Program

Sessional GPA by Year		Sessional GPA by High School Program				
Year	Skills	Regular	Gifted	Private	Eta² Program	Eta² OAC
Year 1	3.76					
Year 2	3.81					
Year 3	3.76					
Year 4	3.79					
Overall	3.78	3.84	3.88	3.62	.00	.03
Sig. F	.377	.397				.001
N	469	398	53	18		

Table 7: Communication Skills by Year and High School Program

Sessional GPA by Year		Sessional GPA by High School Program				
Year	Skills	Regular	Gifted	Private	Eta² Program	Eta² OAC
Year 1	3.89					
Year 2	3.73					
Year 3	3.96					
Year 4	3.91					
Overall	3.87	3.83	4.03	3.76	.01	.00
Sig. F	.403	.176				.866
N	466	396	52	18		

Table 8: Interpersonal Skills by Year and High School Program

Sessional GPA by Year		Sessional GPA by High School Program				
Year	Skills	Regular	Gifted	Private	Eta² Program	Eta² OAC
Year 1	3.74					
Year 2	3.66					
Year 3	3.75					
Year 4	3.85					
Overall	3.75	3.83	3.82	3.60	.00	.01
Sig. F	.732	.489				.140
N	469	398	53	18		

Table 9: Quantitative Skills by Year and High School Program

Sessional GPA by Year		Sessional GPA by High School Program				
Year	Skills	Regular	Gifted	Private	Eta² Program	Eta² OAC
Year 1	3.21					
Year 2	3.19					
Year 3	3.28					
Year 4	3.27					
Overall	3.24	3.14	3.25	3.33	.00	.09
Sig. F	.068	.481				.000
N	440	372	50	18		

A second aspect of university achievement that can be examined is the number of credits students complete in a session (six credits equal one full course). As shown in Table 3, the number of completed credits declines progressively from 27.3 in the first year to 22.4 in the fourth. This difference, however, is not statistically significant (.099). By comparison, differences based on high school program of study are statistically significant (.013). Moreover, there are slight differences in the number of credits completed by graduates of gifted programs (26.1), graduates of regular programs (24.8), and graduates of private schools (23.8). Nonetheless, as shown by eta squared (.02), the relationship between program and completed credits, while statistically significant, is weak. With an eta squared of .11 and a level of significance of .000, the connection between OAC marks and number of completed credits is higher than between program and completed credits.

Overall, the information in Table 2 indicates that graduates of gifted programs complete *slightly* more credits than other students. The effect of high school program on completed credits, however, is weak.

In terms of the objective measures of achievement examined in this section, it is clear that having graduated from a gifted program does not result in higher marks in university. In addition, there is only a marginal difference in completed credits that can be traced to having participated in a gifted high school program. As a result, it can be concluded that high school gifted programs have minimal implications for how students will fare in university.

Skills Development

In addition to objective measures of achievement made available through administrative records, information on self-assessments of skills was obtained through survey questions. Students were presented with a general question that asked, "Compared to other students you know at York at your level, how do you rate your competence on each of the following?" Included among the options were:

- Thinking and reasoning skills
- Problem solving skills
- Planning and organizing skills
- Communication skills
- Interpersonal and communication skills
- Quantitative/mathematical skills

Students rated themselves on a five point scale where 1 meant 'extremely low' and 5 'extremely high'.

While there is evidence supporting the validity of self-assessments of skills and knowledge (Baird, 1976; Berdie, 1971; Dumont and Troelstrup, 1980; Evers and Associates, 1993; McMorris and Ambrosino, 1973; Pike, 1994; Pike, 1995a; Pike, 1995b; Pohlmann and Beggs, 1974), it is difficult to comment on the validity of skills comparisons students make with their peers at a similar level. As a result, in this study, self-assessments of skills will be viewed as indicators of self-concepts - if a student feels that his/her skill level is high compared to that of other students, independent of the validity of this assessment, the student can be viewed as having a relatively positive self-concept. As pointed out by Pascarella and Terenzini (1991:171):

> Self-concept is a relational term that is used to denote students' judgements of their competence or skills (whether academic or social) *relative to those of other students*.

The information presented in Table 4 shows that there is very little difference in self assessments of thinking and reasoning skills between years one and four. In the former the overall rating is 3.94; in the latter 3.95. These differences are not statistically significant. There are, however, differences over all four years in the scores of students from regular (3.83) and gifted (4.19) programs and those from private schools (3.84). Moreover, these differences are significant at the .042 level. In addition, the eta squared for the impact of program (.04) is slightly higher than that for OAC marks (.01). While the former is statistically significant (.042), the latter is not (.079). In essence, students from gifted programs have better self-concepts than other students with respect to their thinking and reasoning skills.

Similar conclusions emerge when problem solving skills are examined. Information in Table 5 shows that there is very little change between first (3.79) and fourth (3.84) years. Graduates of gifted programs, however, score higher (4.09) than students from regular programs (3.68) and from private schools (3.69). These differences are significant at the .000 level; moreover, the .05 (F significant at .000 level) and .01 values of eta squared for program and OAC marks (significant at the .019 level) respectively indicate that the former has more of an impact on skills than the latter. The effect of each, however, is low.

When planning and organizing skills are examined - Table 6 - once again there is little change between first (3.76) and fourth (3.79) years (significance of F is .732). There are, in addition, no statistically significant differences based on program: the scores for graduates of regular and gifted programs and private schools are 3.84, 3.88, and 3.62 respectively. The value of eta squared for program is .00 and for OAC marks, only .03; however, the latter is statistically significant (.001). In essence, there is virtually no change from one year of study to the next for planning and organizing skills and graduates of gifted programs

have no more positive self-concepts than others that they have these skills.

The information in Table 7 shows that like other skills examined, self-assessments of communication skills vary little between first (3.89) and fourth (3.91) years. Similarly, while the scores for graduates of gifted programs (4.03) are slightly higher than those of regular programs (3.83) and private school graduates (3.76), the differences are not statistically significant. Eta squared for program and OAC marks is only .01 and .00 respectively. Overall, communication skills vary by neither year, high school program, nor OAC marks.

The story is repeated for interpersonal skills as presented in Table 8. Changes between year one (3.74) and year four (3.85) are small and not statistically significant (.732). In addition, the slight differences that exist among graduates of regular programs (3.83), gifted programs (3.82), and graduates of private schools (3.60) are not statistically significant (.489), and eta squared for program (.00) and OAC marks (.01) are small and not statistically significant.

In the final table - Table 9 - we can examine quantitative and mathematical skills. Although there is a slight increase in scores between year one (3.21) and the final year (3.27) changes are neither progressive nor are they statistically significant (.068). While students from regular programs (3.14) do not score as high as graduates of gifted programs (3.25), the highest scores are for graduates of private schools (3.33); however, these differences are not statistically significant. Moreover, while the eta squared for program is .00 it is a slightly higher (but still low) .09 for OAC marks and the eta squared for OAC marks is statistically significant (.000). In conclusion, only OAC marks have implications for self-assessments of quantitative and math skills.

(Throughout this analysis no reference has been made to the possibility that the year to year fluctuations in achievement and skills' scores may vary by the type of high school program. For example, although there may be little overall year to year fluctuation, is there perhaps a regular increase for graduates of, say, gifted programs? Possibilities like these were not mentioned for the simple reason that in no case was there a statistically significant year to year difference within program categories.)

Overall, the information presented in this section indicates that after controlling for OAC marks, having come from a gifted program only affects self-assessments of thinking and reasoning skills and problem solving skills. Moreover, although graduates of gifted programs score themselves higher on these dimensions than graduates of regular programs or private schools, differences are not large. As a result, to the degree that self-assessments of skills can be viewed as a measure of self-concepts, it is possible to conclude that

participation in a gifted high school program may have led to a marginal improvement in self-concept that carries over into the university setting.

Conclusion

The legislation responsible for the provision of gifted programs in Ontario's schools was based on the assumption that some students had a degree of ability that required 'differentiated learning experiences of a depth and breadth beyond those normally provided in the regular program to satisfy the level of potential indicated.' It would seem, however, that for students entering York, although the graduates of gifted programs complete slightly more credits than the graduates of regular programs and private schools, and they display slightly more positive self-concepts as measured in self-assessed skills, they do not get better marks. As a result, we can conclude that in terms of university performance, participating in a gifted program adds little value to what is obtained from a regular high school program. To this extent it may be possible to view the process in Ontario that results in the conferring on students of gifted labels as questionable. Before this can be settled with certainty, however, it is necessary to carry out examinations of greater numbers, and a wider selection, of gifted students.

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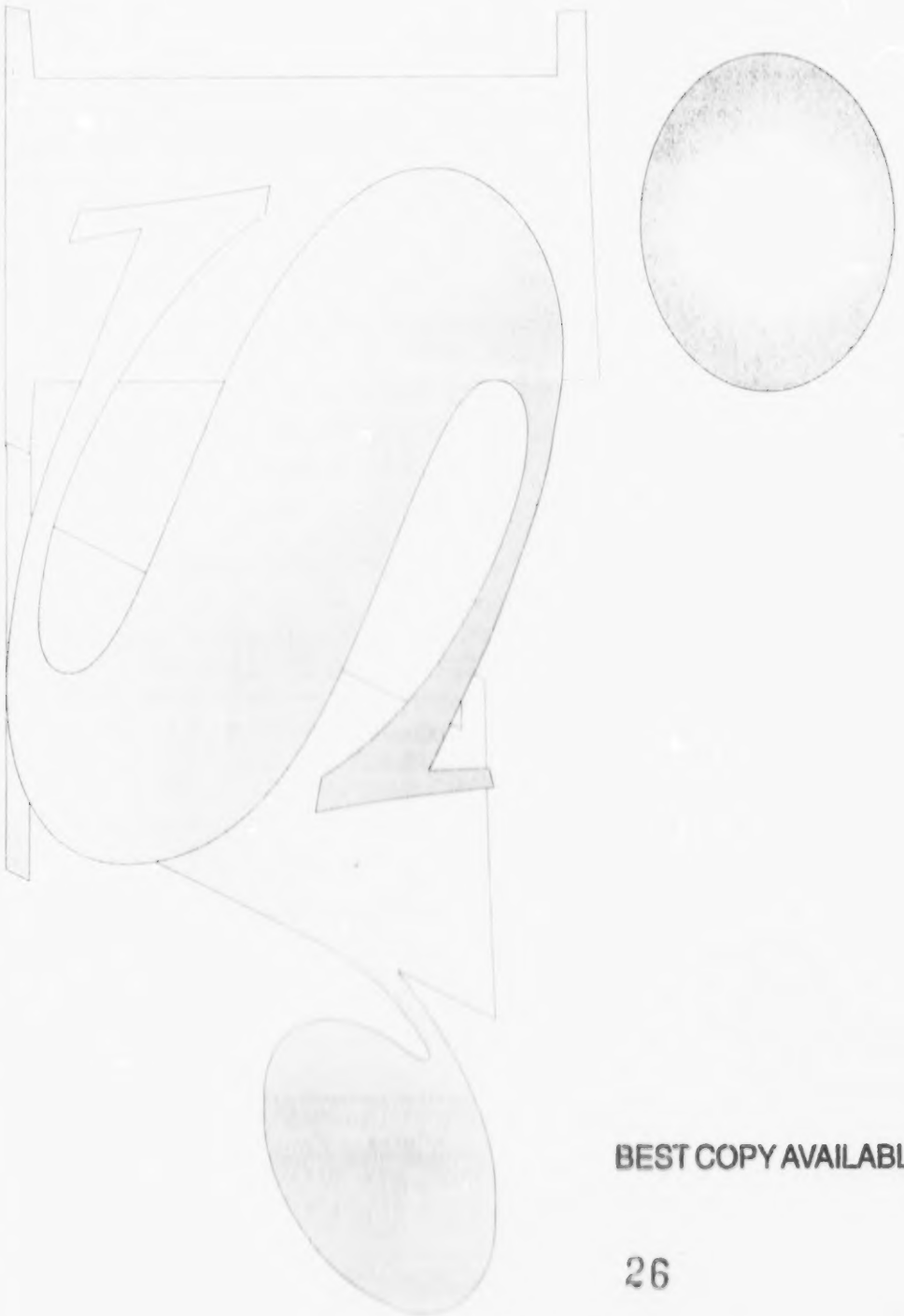

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